

Alternative proposal for spring rate tolerance based on load tolerance DIN 2095

It is obtained from load tolerance formula (1)

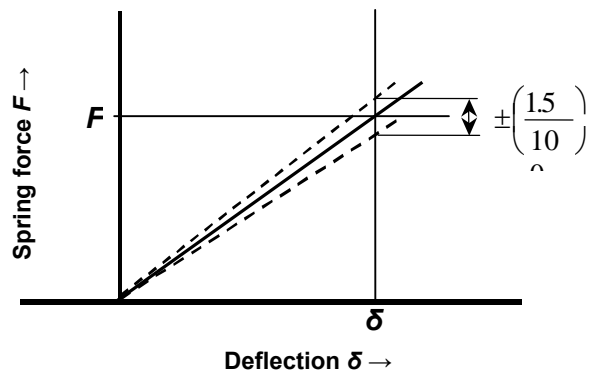
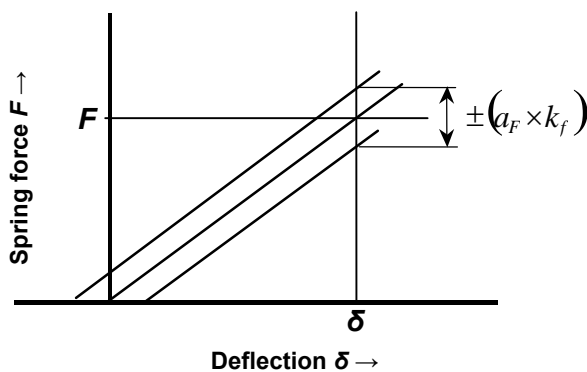
$$A_F = \pm \left(a_F \times k_f + \frac{1.5F}{100} \right) \times Q \text{ ----- Load tolerance formula (1)}$$

Formula (1) can be expanded into $\pm (a_F \times k_f)$ and $\pm \left(\frac{1.5F}{100} \right)$.

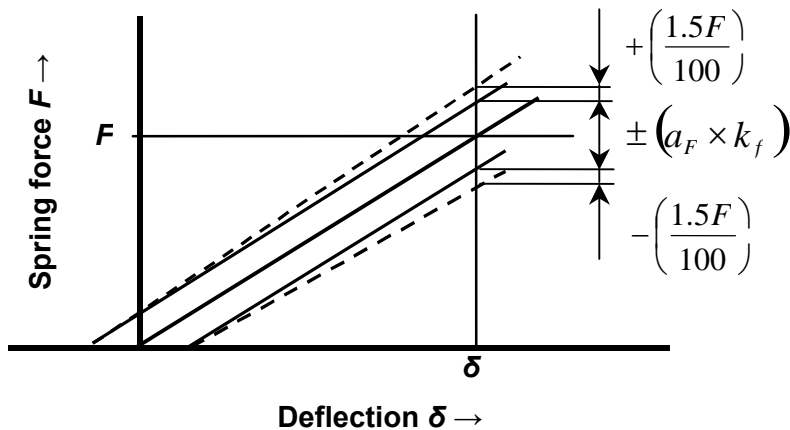
The former shows the variation (tolerance) of free length, and the latter shows the variation (tolerance) of spring rate. The following graphs show two kinds of the variations within the formula.

Graph of $\pm (a_F \times k_f)$

Graph of $\pm \left(\frac{1.5F}{100} \right)$



Below is a graph of combined variations of free length and spring rate.



Therefore, the new tolerance formula for spring rate is shown as below.

$$A_R = \pm \left(\frac{1.5F}{100} \right) \iff \pm 1.5\% \text{ ----- Spring rate tolerance alternative formula (4)}$$